

LAMPIRAN

Lampiran 1 Certificate Of Analysis

Vitamin E Asetat



DL-A-TOCOPHERYL ACETATE



CERTIFICATE OF ANALYSIS

Productcode : 0420085
 Lot No. : UT18080219
 Analysis No. : 03D07192

Test	Result	Limits / Specifications	Dimension / Units
Appearance visual	clear viscous oil	clear viscous oil	
Colour visual	colourless	colourless almost colourless slightly yellow slightly greenish yellow	
Identity GC	corresponds	corresponds	
Optical rotation Ph.Eur.	0.00	-0.01 to +0.01	°
Heavy metals ICP-MS	corresponds*	max. 10	ppm
Lead ICP-MS	corresponds*	max. 2	ppm
Arsenic ICP-MS	corresponds*	max. 1	ppm
Mercury ICP-MS	corresponds*	max. 0.1	ppm
Cadmium ICP-MS	corresponds*	max. 0.5	ppm
Residual Solvents - Pyridine GC	corresponds*	max. 200	ppm
- Toluene GC	corresponds*	max. 890	ppm
Acidity Titration / USP	0.1	max. 1.0	ml 0.10N NaOH
Related Subst. (Ph.Eur.) - Impurity A GC	0.1	max. 0.5	%
- Impurity B GC	0.6	max. 0.6	%
- Impurity C (free tocopherol) GC	0.1	max. 0.5	%
- Impurity D and E GC	0.3	max. 1.0	%
- Any other impurity, each GC	0.07	max. 0.25	%
- Total GC	1.6	max. 2.5	%

DSM Nutritional Products Ltd
 Branch Site Sisseln
 Quality Management
 CH-4334 Sisseln

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Date of issue : 31-Aug-2018

**DL-A-TOCOPHERYL ACETATE****CERTIFICATE OF ANALYSIS**

Productcode : 0420085
Lot No. : UT18080219
Analysis No. : 03D07192

Test	Result	Limits / Specifications	Dimension / Units
Assay Tocopherylacetate (Ph.Eur.) GC	99.4	96.5 to 102.0	%
Assay Tocopherylacetate (USP/FCC) GC	98.5	96.0 to 102.0	%

*) checked at regular intervals

This lot was analysed and released by our authorized Quality Control Department and was found to meet the specifications as given above.

The product meets all requirements of the following valid compendia when tested accordingly:
USP, FCC, Ph.Eur.

DSM Nutritional Products Ltd
The Quality Assurance Manager

Zoehner Juergen

Precirol ATO5®



GATTEFOSSÉ

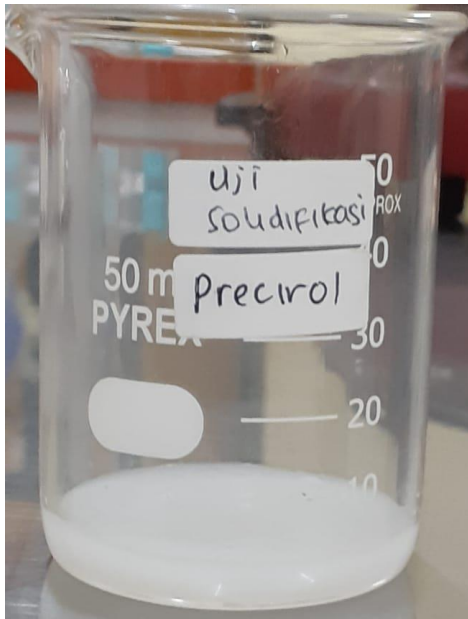
Certificate of Analysis

Product name	: PRECIROL ATO 5		
Item N°	: 3092PPD		
Batch N°	: 189604		
Manufacturing date	: 05.2018		
Expiry date	: 05.2020		
CHEMICAL DEFINITION : Glycerol distearate (type D EP / Glycerol distearate NF).			
Characteristic	Method	Specification	Result
MANUFACTURING PLANT		Gattefossé : 01 / Inovys : 06	01.01
APPEARANCE	MA0193	Fine white powder	Conforms
ODOUR	MA0170	Faint	Conforms
COLOUR (Gardner Scale)	MA0214	< = 3.0	0.9
DROP POINT (METTLER)	MA0003	53.0 to	58.3
ACID VALUE	MA0008	< = 5.00 mgKOH/g	1.76
SAPONIFICATION VALUE	MA0172	165 to 195 mgKOH/g	167
IODINE VALUE	MA0082	< = 3.0 gI2/100g	< = 3.0*
FREE GLYCEROL CONTENT	MA0005	< = 1.0 %	0.2
TOTAL MONOGLYCERIDES CONTENT	MA0006	8.0 to 22.0 %	17.4
TOTAL DIESTERS CONTENT	MA0006	40.0 to 60.0 %	50.7
TOTAL TRIESTERS CONTENT	MA0006	25.0 to 35.0 %	30.8
PALMITIC ACID (C16)	MA0002	40.0 to 60.0 %	44.5
STEARIC ACID (C18)	MA0002	40.0 to 60.0 %	53.2
SUM OF PALMITIC AND STEARIC ACIDS	MA0002	> = 90.0 %	97.7
WATER CONTENT	MA0007	< = 1.0 %	< 0.1
TOTAL ASHES CONTENT	MA0028	< = 0.1 %	< = 0.1*
NICKEL CONTENT	MA0256	< 1 ppm	Conforms
HEAVY METALS CONTENT (Pb)	MA0032	< 10 ppm	Conforms *
* Characteristic guaranteed but not tested. This batch was released by our authorized Quality Manager and was found to meet the specifications as stated above. The above results do not discharge the customer from the obligation to carry out an inspection of goods received. This report has been produced electronically and does not require a signature.			
Printing Date : 11.12.2018		Quality Manager Magali DRONNIER	

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 SAS au capital de 4 850 000 Euros - R.C.S. Lyon 8 389 588 900 - N° d'entreprise CEE FR 43 388 586 900

Lampiran 2 Pengujian Daya Jerap



Lampiran 3 Pengujian Kelarutan Vitamin E Asetat dalam surfaktan



Lampiran 4 Kurva Kalibrasi Vitamin E Asetat

Perhitungan pembuatan larutan Vitamin E Asetat

- Larutan induk

$$\text{Konsentrasi Larutan} = \frac{\text{Bobot Vitamin E Asetat}}{\text{Volume}}$$

$$100 \text{ ppm} = \frac{100 \text{ mg}}{1000 \text{ ml}}$$

$$= \frac{10 \text{ mg}}{100 \text{ ml}}$$

$$\text{Bobot Vitamin E} = \frac{5 \text{ mg}}{50 \text{ ml}}$$

- Pengenceran Larutan

- Konsentrasi 10 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 10 \text{ ppm} \\
 V_1 &= \frac{50 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,5 \text{ ml} = 500 \mu\text{L}
 \end{aligned}$$

b. Konsentrasi 9 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 9 \text{ ppm} \\
 V_1 &= \frac{45 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,45 \text{ ml} = 450 \mu\text{L}
 \end{aligned}$$

c. Konsentrasi 8 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 8 \text{ ppm} \\
 V_1 &= \frac{40 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,4 \text{ ml} = 400 \mu\text{L}
 \end{aligned}$$

d. Konsentrasi 7 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 7 \text{ ppm} \\
 V_1 &= \frac{35 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,35 \text{ ml} = 350 \mu\text{L}
 \end{aligned}$$

e. Konsentrasi 6 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 6 \text{ ppm} \\
 V_1 &= \frac{30 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,3 \text{ ml} = 300 \mu\text{L}
 \end{aligned}$$

f. Konsentrasi 5 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 100 \text{ ppm} &= 5 \text{ ml} \times 5 \text{ ppm} \\
 V_1 &= \frac{25 \text{ ml}}{100 \text{ ppm}} \\
 V_1 &= 0,25 \text{ ml} = 250 \mu\text{L}
 \end{aligned}$$

g. Konsentrasi 4 ppm

$$V_1 \times C_1 = V_2 \times C_2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 4 \text{ ppm}$$

$$V1 = \frac{20 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,2 \text{ ml} = 200 \mu\text{L}$$

h. Konsentrasi 3 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 3 \text{ ppm}$$

$$V1 = \frac{15 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,15 \text{ ml} = 150 \mu\text{L}$$

i. Konsentrasi 2 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 2 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,1 \text{ ml} = 100 \mu\text{L}$$

j. Konsentrasi 1 ppm

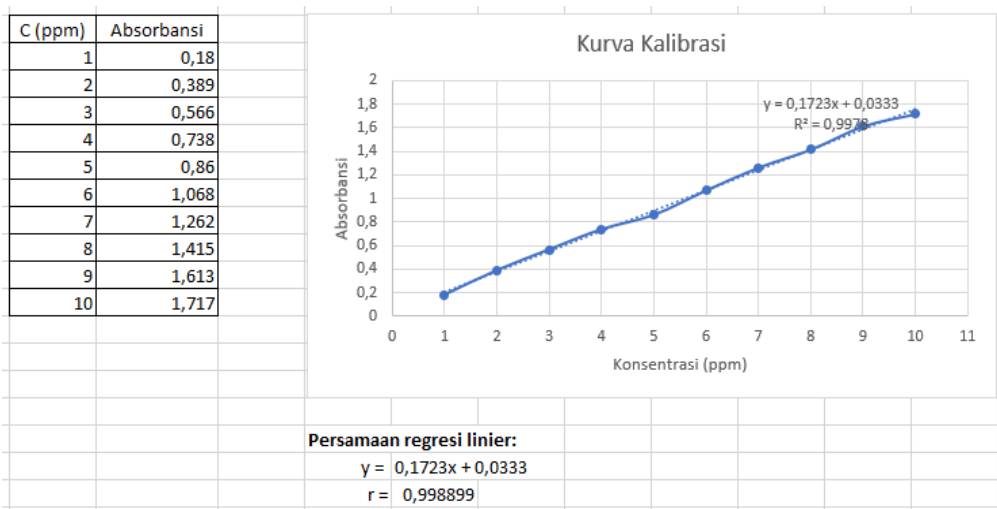
$$V1 \times C1 = V2 \times C2$$

$$V1 \times 100 \text{ ppm} = 5 \text{ ml} \times 1 \text{ ppm}$$

$$V1 = \frac{5 \text{ ml}}{100 \text{ ppm}}$$

$$V1 = 0,05 \text{ ml} = 50 \mu\text{L}$$

- Kurva kalibrasi Vitamin E Asetat



Lampiran 5 Perhitungan %EE NLC Vitamin E Asetat

Konsentrasi Larutan

$$\text{Konsentrasi} = \frac{y-a}{b}$$

Bobot zat aktif bebas

$$\text{Bobot zat aktif bebas} = \text{Konsentrasi} \times \text{Volume} \times \text{fp}$$

Rumus %EE

$$\% \text{ EE} = \frac{\text{total zat aktif} - \text{zat aktif bebas}}{\text{total zat aktif}} \times 100\%$$

Data pengukuran efesiensi penjerapan hari ke-1

Formula	Abs	C (ppm)	Fp	C' (ppm)	Vol (mL)	mcg	mg	%EE	Rata-rata
F1	0,274	1,396982	100	139,6982	10	1396,982	1,396982	95,34339	96,14948
(3:1:2,5)	0,212	1,037145	100	103,7145	10	1037,145	1,037145	96,54285	
	0,211	1,031341	100	103,1341	10	1031,341	1,031341	96,5622	
F2	0,705	3,898433	100	389,8433	10	3898,433	3,898433	87,00522	87,94029
(5:1:1,5)	0,622	3,416715	100	341,6715	10	3416,715	3,416715	88,61095	
	0,643	3,538595	100	353,8595	10	3538,595	3,538595	88,20468	
F3	0,41	2,186303	100	218,6303	10	2186,303	2,186303	92,71232	91,04211
(2:1:3)	0,546	2,975624	100	297,5624	10	2975,624	2,975624	90,08125	
	0,533	2,900174	100	290,0174	10	2900,174	2,900174	90,33275	
F4	0,195	0,938479	100	93,84794	10	938,4794	0,938479	96,87174	97,39408
(6:1:1)	0,146	0,654092	100	65,40917	10	654,0917	0,654092	97,81969	
	0,163	0,752757	100	75,27568	10	752,7568	0,752757	97,49081	
F5	0,386	2,047011	100	204,7011	10	2047,011	2,047011	93,17663	92,86064
(4:1:2)	0,419	2,238537	100	223,8537	10	2238,537	2,238537	92,53821	
	0,402	2,139872	100	213,9872	10	2139,872	2,139872	92,86709	

1. F1

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,274 - 0,0333}{0,1723} = 1,3969 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,3969 \times 10 \times 100$$

$$= 1396,9 \mu\text{g}$$

$$= 1,3969 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 1,369 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 95,34 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,212 - 0,0333}{0,1723} = 1,0371 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,0371 \times 10 \times 100$$

$$= 1037,1 \mu\text{g}$$

$$= 1,0371 \text{ mg}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 1,0371 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 96,54 \%\end{aligned}$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,211 - 0,0333}{0,1723} = 1,0313 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 1,0313 \times 10 \times 100 \\ &= 1031,3 \mu\text{g} \\ &= 1,0313 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 1,0313 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 96,56 \%\end{aligned}$$

2. F2

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,705 - 0,0333}{0,1723} = 3,8984 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 3,8984 \times 10 \times 100 \\ &= 3898,4 \mu\text{g} \\ &= 3,8984 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 3,8984 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 87,00 \%\end{aligned}$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,622 - 0,0333}{0,1723} = 3,4167 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 3,4167 \times 10 \times 100 \\ &= 3416,7 \mu\text{g} \\ &= 3,4167 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 3,4167 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 88,61 \%\end{aligned}$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,643 - 0,0333}{0,1723} = 3,5385 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 3,5385 \times 10 \times 100 \\ &= 3538,5 \mu\text{g} \\ &= 3,5385 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 3,5385 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 88,13 \%\end{aligned}$$

$$= 88,20 \%$$

3. F3

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,41 - 0,0333}{0,1723} = 2,1863 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,1863 \times 10 \times 100$$

$$= 2186,3 \mu\text{g}$$

$$= 2,1863 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,1863 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 92,71 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,546 - 0,0333}{0,1723} = 2,9756 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,9756 \times 10 \times 100$$

$$= 2975,6 \mu\text{g}$$

$$= 2,9756 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,9756 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,08 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,533 - 0,0333}{0,1723} = 2,9001 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,9001 \times 10 \times 100$$

$$= 2900,1 \mu\text{g}$$

$$= 2,9001 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,9001 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,33 \%$$

4. F4

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,195 - 0,0333}{0,1723} = 0,9384 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 0,9384 \times 10 \times 100$$

$$= 938,4 \mu\text{g}$$

$$= 0,9384 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 0,9384 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 96,87 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,146-0,0333}{0,1723} = 0,6540 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 0,6540 \times 10 \times 100$$

$$= 654,0 \mu\text{g}$$

$$= 0,6540 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 0,6540 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 97,81 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,163-0,0333}{0,1723} = 0,7527 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 0,7527 \times 10 \times 100$$

$$= 752,7 \mu\text{g}$$

$$= 0,7527 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 0,7527 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 97,49 \%$$

5. F5

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,386-0,0333}{0,1723} = 2,0470 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,0470 \times 10 \times 100$$

$$= 2047,0 \mu\text{g}$$

$$= 2,047 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,047 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 93,17 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,419-0,0333}{0,1723} = 2,2385 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,2385 \times 10 \times 100$$

$$= 2238,5 \mu\text{g}$$

$$= 2,2385 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,2385 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 92,53 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,402 - 0,0333}{0,1723} = 2,1398 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,1398 \times 10 \times 100$$

$$= 2139,8 \mu\text{g}$$

$$= 2,1398 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,1398 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 92,86 \%$$

Data pengukuran efesiensi penjerapan hari ke-30

Formula	Abs	C (ppm)	Fp	C' (ppm)	Vol (mL)	mcg	mg	%EE	Rata-rata
PMP 1	0,331	1,7278	100	172,78	10	1727,8	1,7278	94,24067	95,16928
(3:1:2,5)	0,25	1,25769	100	125,769	10	1257,69	1,25769	95,8077	
	0,268	1,362159	100	136,2159	10	1362,159	1,362159	95,45947	
PMP 2	0,772	4,28729	100	428,729	10	4287,29	4,28729	85,70903	85,1222
(5:1:1,5)	0,896	5,006965	100	500,6965	10	5006,965	5,006965	83,31012	
	0,739	4,095763	100	409,5763	10	4095,763	4,095763	86,34746	
PMP 3	0,504	2,731863	100	273,1863	10	2731,863	2,731863	90,89379	90,47462
(2:1:3)	0,548	2,987232	100	298,7232	10	2987,232	2,987232	90,04256	
	0,525	2,853743	100	285,3743	10	2853,743	2,853743	90,48752	
PMP 4	0,118	0,491584	100	49,15844	10	491,5844	0,491584	98,36139	96,43322
(6:1:1)	0,214	1,048752	100	104,8752	10	1048,752	1,048752	96,50416	
	0,321	1,669762	100	166,9762	10	1669,762	1,669762	94,43413	
PMP 5	0,544	2,964016	100	296,4016	10	2964,016	2,964016	90,11995	90,98407
(4:1:2)	0,441	2,366222	100	236,6222	10	2366,222	2,366222	92,11259	
	0,513	2,784098	100	278,4098	10	2784,098	2,784098	90,71967	

1. F1

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,331 - 0,0333}{0,1723} = 1,7278 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,7278 \times 10 \times 100$$

$$= 1727,8 \mu\text{g}$$

$$= 1,7278 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 1,7278 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 94,24 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,25 - 0,0333}{0,1723} = 1,2576 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,2576 \times 10 \times 100$$

$$= 1257,6 \mu\text{g}$$

$$= 1,2567 \text{ mg}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 1,2567 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 95,80 \%\end{aligned}$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,268 - 0,0333}{0,1723} = 1,3621 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 1,3621 \times 10 \times 100 \\ &= 1362,1 \mu\text{g} \\ &= 1,3621 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 1,3621 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 95,45 \%\end{aligned}$$

2. F2

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,772 - 0,0333}{0,1723} = 4,2872 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 4,2872 \times 10 \times 100 \\ &= 4287,2 \mu\text{g} \\ &= 4,2872 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 4,2872 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 85,70 \%\end{aligned}$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,896 - 0,0333}{0,1723} = 5,0069 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 5,0069 \times 10 \times 100 \\ &= 5006,9 \mu\text{g} \\ &= 5,0069 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 5,0069 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 83,31 \%\end{aligned}$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,739 - 0,0333}{0,1723} = 4,0957 \text{ ppm}$$

$$\begin{aligned}\text{Bobot zat aktif bebas} &= 4,0957 \times 10 \times 100 \\ &= 4095,7 \mu\text{g} \\ &= 4,0957 \text{ mg}\end{aligned}$$

$$\begin{aligned}\% \text{ EE} &= \frac{30 \text{ mg} - 4,0957 \text{ mg}}{30 \text{ mg}} \times 100\% \\ &= 86,68 \%\end{aligned}$$

$$= 86,34 \%$$

3. F3

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,504 - 0,0333}{0,1723} = 2,7318 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,7318 \times 10 \times 100$$

$$= 2731,8 \mu\text{g}$$

$$= 2,7318 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,7318 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,89 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,548 - 0,0333}{0,1723} = 2,9872 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,9872 \times 10 \times 100$$

$$= 2987,2 \mu\text{g}$$

$$= 2,9872 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,9872 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,04 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,525 - 0,0333}{0,1723} = 2,8537 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,8537 \times 10 \times 100$$

$$= 2853,7 \mu\text{g}$$

$$= 2,8537 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,8537 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,48 \%$$

4. F4

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,118 - 0,0333}{0,1723} = 0,4915 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 0,4915 \times 10 \times 100$$

$$= 491,5 \mu\text{g}$$

$$= 0,4915 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 0,4915 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 98,36 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,214 - 0,0333}{0,1723} = 1,0487 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,0487 \times 10 \times 100$$

$$= 1048,7 \mu\text{g}$$

$$= 1,0487 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 1,0487 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 96,50 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,321 - 0,0333}{0,1723} = 1,6697 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 1,6697 \times 10 \times 100$$

$$= 1669,7 \mu\text{g}$$

$$= 1,6697 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 1,6997 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 94,43 \%$$

5. F5

- Absorbansi 1

$$\text{Konsentrasi} = \frac{0,544 - 0,0333}{0,1723} = 2,9640 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,9640 \times 10 \times 100$$

$$= 2964,0 \mu\text{g}$$

$$= 2,9640 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,9640 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,11 \%$$

- Absorbansi 2

$$\text{Konsentrasi} = \frac{0,441 - 0,0333}{0,1723} = 2,3662 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,3662 \times 10 \times 100$$

$$= 2366,2 \mu\text{g}$$

$$= 2,3662 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,3662 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 92,11 \%$$

- Absorbansi 3

$$\text{Konsentrasi} = \frac{0,513 - 0,0333}{0,1723} = 2,7840 \text{ ppm}$$

$$\text{Bobot zat aktif bebas} = 2,7840 \times 10 \times 100$$

$$= 2784,0 \mu\text{g}$$

$$= 2,7840 \text{ mg}$$

$$\% \text{ EE} = \frac{30 \text{ mg} - 2,7840 \text{ mg}}{30 \text{ mg}} \times 100\%$$

$$= 90,71 \%$$

Lampiran 6 Hasil Karakterisasi NLC Vitamin E Asetat

Data Karakterisasi NLC Vitamin E Asetat Hari ke-1

Formula (Lipid padat : Surfaktan)	Ukuran Partikel (nm)	PdI	Zeta Potensial (mV)	%EE
F1 (3 : 2,5)	244,53±7,83	0,39±0,03	-29,73±0,71	96,15±0,70
F2 (5 : 1,5)	192,57±2,72	0,19±0,02	-25,53±0,57	87,94±0,83
F3 (2 : 3)	194,13±2,94	0,18±0,02	-27,63±0,75	91,04±1,45
F4 (6 : 1)	294,73±6,30	0,43±0,03	-30,40±0,56	97,39±0,48
F5 (4 : 2)	299,33±4,35	0,41±0,02	-28,73±1,33	92,86±0,32

Data Karakterisasi NLC Vitamin E Asetat Hari ke-30

Formula (Lipid padat : Surfaktan)	Ukuran Partikel (nm)	PdI	Zeta Potensial (mV)	%EE
F1 (3 : 2,5)	292,13±3,61	0,53±0,05	-32,93±1,29	95,17±0,82
F2 (5 : 1,5)	387,00±19,55	0,68±0,03	-35,27±0,47	85,12±1,60
F3 (2 : 3)	276,33±3,29	0,44±0,04	-34,60±0,87	90,47±0,43
F4 (6 : 1)	360,30±91,10	0,49±0,02	-26,63±2,59	96,43±1,96
F5 (4 : 2)	300,70±11,01	0,51±0,01	-34,30±0,52	90,98±1,02

Lampiran 7 Hasil Uji Statistik Paired T-Test

Paired Samples Test									
		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	F1_UkuranPartikel_H1 - F1_UkuranPartikel_H30	-47.60000	8.24560	4.76060	-68.08322	-27.11678	-9.999	2	.010
Pair 2	F2_UkuranPartikel_H1 - F2_UkuranPartikel_H30	-194.43333	19.07992	11.01580	-241.83048	-147.03619	-17.650	2	.003
Pair 3	F3_UkuranPartikel_H1 - F3_UkuranPartikel_H30	-82.20000	6.09180	3.51710	-97.33286	-67.06714	-23.372	2	.002
Pair 4	F4_UkuranPartikel_H1 - F4_UkuranPartikel_H30	-65.56667	93.78712	54.14802	-298.54678	167.41345	-1.211	2	.350
Pair 5	F5_UkuranPartikel_H1 - F5_UkuranPartikel_H30	-1.36667	13.83920	7.99006	-35.74513	33.01180	-.171	2	.880
Pair 6	F1_PdI_H1 - F1_PdI_H30	-.13767	.07364	.04251	-.32059	.04526	-3.238	2	.084
Pair 7	F2_PdI_H1 - F2_PdI_H30	-.49333	.03406	.01967	-.57795	-.40871	-25.085	2	.002
Pair 8	F3_PdI_H1 - F3_PdI_H30	-.26333	.05514	.03183	-.40031	-.12636	-8.272	2	.014
Pair 9	F4_PdI_H1 - F4_PdI_H30	-.05667	.03421	.01975	-.14165	.02832	-2.869	2	.103
Pair 10	F5_PdI_H1 - F5_PdI_H30	-.09933	.02479	.01431	-.16090	-.03776	-6.942	2	.020
Pair 11	F1_ZetaPotensial_H1 - F1_ZetaPotensial_H30	3.20000	1.90788	1.10151	-1.53943	7.93943	2.905	2	.101
Pair 12	F2_ZetaPotensial_H1 - F2_ZetaPotensial_H30	9.73333	1.01160	.58405	7.22038	12.24629	16.665	2	.004
Pair 13	F3_ZetaPotensial_H1 - F3_ZetaPotensial_H30	6.96667	1.40119	.80898	3.48592	10.44742	8.612	2	.013
Pair 14	F4_ZetaPotensial_H1 - F4_ZetaPotensial_H30	-3.76667	2.97714	1.71885	-11.16228	3.62895	-2.191	2	.160
Pair 15	F5_ZetaPotensial_H1 - F5_ZetaPotensial_H30	5.56667	1.65025	.95277	1.46721	9.66612	5.843	2	.028
Pair 16	F1_EE_H1 - F1_EE_H30	.98020	.21222	.12253	.45302	1.50739	8.000	2	.015
Pair 17	F2_EE_H1 - F2_EE_H30	2.81808	2.16835	1.25190	-2.56839	8.20455	2.251	2	.153
Pair 18	F3_EE_H1 - F3_EE_H30	.56749	1.08775	.62801	-2.13463	3.26960	.904	2	.462
Pair 19	F4_EE_H1 - F4_EE_H30	.96086	2.29383	1.32434	-4.73732	6.65903	.726	2	.544
Pair 20	F5_EE_H1 - F5_EE_H30	1.87657	1.33628	.77150	-1.44294	5.19608	2.432	2	.136

Lampiran 8 Dokumentasi Penelitian



Lampiran 9 Format Surat Pernyataan Bebas Plagiasi**SURAT PERNYATAAN**

Yang bertanda tangan di bawah ini,

Nama : Astri Mustika Dewi

N P M : 11181006

adalah mahasiswa Fakultas Farmasi, Universitas Bhakti Kencana, menyatakan dengan sesungguhnya bahwa Naskah Tugas Akhir/Skripsi yang saya tulis dengan judul:

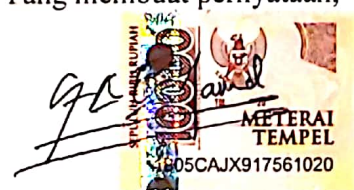
PENGEMBANGAN FORMULA DAN KARAKTERISASI *NANOSTRUCTURED LIPID CARRIER* (NLC) VITAMIN E ASETAT MENGGUNAKAN LIPID PADAT *GLYCERYL PALMITOSTEARATE* (PRECIROL®) DAN SURFAKTAN *LAURYL GLUCOSIDE* (PLANTACARE®) DENGAN APLIKASI *DESIGN EXPERT*

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Bandung , 30 Agustus 2022

Yang membuat pernyataan,



(Astri Mustika Dewi)

NPM 11181006

Lampiran 10 Format Surat Persetujuan untuk dipublikasikan di media on line**SURAT PERNYATAAN**

Yang bertanda tangan di bawah ini,

Nama : Astri Mustika Dewi

N P M : 11181006

Menyatakan bahwa demi kepentingan perkembangan ilmu pengetahuan, saya menyetujui abstrak Skripsi yang saya tulis dengan judul:

PENGEMBANGAN FORMULA DAN KARAKTERISASI *NANOSTRUCTURED LIPID CARRIER* (NLC) VITAMIN E ASETAT MENGGUNAKAN LIPID PADAT *GLYCERYL PALMITOSTEARATE* (PRECIROL®) DAN SURFAKTAN *LAURYL GLUCOSIDE* (PLANTACARE®) DENGAN APLIKASI *DESIGN EXPERT*

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(Astri Mustika Dewi)
NPM 11181006